



DEPARTMENT OF TRANSPORTATION  
HAZARDOUS MATERIALS REGULATIONS BOARD  
WASHINGTON, D.C. 20590

32912

[Docket No. HM-109; Amdt. Nos. 173-83,  
179-15]

**PART 173—SHIPPERS**

**PART 179—SPECIFICATIONS FOR  
TANK CARS**

**Tank Car Tank Head Shields; Denial of  
Petitions for Reconsideration**

On July 23, 1974 (39 FR 27572, July 30, 1974), the Hazardous Materials Regulations Board issued Amendments Numbered 173-83 and 179-15 under Docket Number HM-109. These amendments require a tank head protection device (head shield) to be affixed to each end of all specification DOT-112A and 114A tank cars built after August 30, 1974, used for the transportation of compressed gases be equipped with protective head shields by January 1, 1978. In developing these amendments, the Board analyzed economic, research and accident data and concluded that the head shield specified in these amendments was cost beneficial and would be effective in reducing tank head punctures.

Subsequent to the issuance of these amendments, the following persons submitted Petitions for Reconsideration under provision of Title 49 of the Code Federal Regulations, § 170.35:

The Compressed Gas Association.  
The Railway Progress Institute on behalf of  
ACF Industries, Inc., General American  
Transportation Corporation, North American  
Car Corporation, and Trans Union Corporation.

The Association of American Railroads.  
Phillips Petroleum Company.  
Cities Service Oil Company.  
Ethyl Corporation.  
Pennwalt Corporation.  
Cities Service Pipe Line Company.  
Amoco Oil Company.  
The Manufacturing Chemists Association.

Additionally, the following petitions were filed subsequent to ten days prior to the effective date of the rule, but prior to the effective date of the rule:

American Petroleum Institute.  
FMC Corporation.  
Continental Oil Company.  
Republic Car Line Inc.

Although these four petitions were filed late, the Board has decided to consider them.

Most of the petitions endorsed the petition submitted by the Railway Progress Institute. In that petition, the Institute stated three allegations which are discussed separately.

I. The Board has misconceived and misconstrued the material presented to it by respondents; reconsideration is urgently required to permit appropriate analysis of this critically relevant data.

To the contrary, the Board stated in the preamble to these amendments that all respondents believed that imposition of a requirement for head shields was premature; however, the Board noted that:

Statistical evidence already exists through testing that a head shield would be both

effective in reducing tank head punctures and would also be cost beneficial.

Results of several studies were summarized in that preamble.

The petitioners state that the effectiveness of the prescribed head shield is based essentially upon laboratory tests and assumptions based on analysis of prior accident information. The Board has relied upon such data and information in developing this regulation and it believes that due to the potential tragic consequences of head punctures in liquefied compressed gas laden specification DOT-112A and 114A tank cars, prompt action to apply this data and information so as to upgrade the safety of this equipment is essential.

The petitioners state that the Board failed to consider the relative merits of a standard coupler with top and bottom shelves vis-a-vis the specified head shield. The Board considered the information submitted both prior to and subsequent to the closing data for the filing of comments to the Notice of Proposed Rule Making. In addition, the Board analyzed the results of studies, tests and accident investigatory reports in developing these amendments. In its expert opinion, the Board does not believe that there is likelihood that the top and bottom shelved coupler will prevent head punctures as effectively as the specified head shield.

II. The material which has become available since the terminal date for filing statements in Docket No. HM-109 (September 4, 1973) clearly establishes and confirms the superiority of the E coupler with top and bottom shelves as a head puncture preventative; reconsideration of the issued rule should be granted and a substitute rule involving the shelf-type coupler should be proposed for adoption.

In claiming that new information is now available to the Board which clearly establishes and confirms the superiority of the E coupler with top and bottom shelves as a head puncture preventative, Railroad Tank Car Safety Research and Test Project Reports RA-10-3-25 concerning a July 1, 1973, railroad accident and RA-10-4-28 concerning a February 9, 1974, railroad accident are submitted as "new material." The Board had received copies of both reports and included that information in its analysis of the effectiveness of a shelf coupler prior to issuing these amendments. Also, the Board had the benefit of a field investigatory report on the accident that occurred near Romney, Kentucky, which is referred to by the petitioners as RA-10-3-25. After its review of those reports, the Board determined that the information contained provided no reason to conclude that such couplers have the effectiveness that the specified head shields have in preventing tank head punctures.

Likewise, the report by Siniat, Helliesan & Eichner, Inc., dated June 12, 1974, had been analyzed by the Board prior to issuance of these amendments and has



again been analyzed prior to the issuance of this denial. The Board does not concur with their conclusion:

We further conclude that the evidence bearing on the E type coupler modified with top and bottom shelves, compared with either the RPI/AAR-designator or the DOT-design head shield indicates the preferability of the coupler solution under all circumstances.

As a result of analysis of head punctures in these cars from January 1970 through June 1974, the Board has determined that of the 29 cars which received head punctures 18 cars (or 62 percent) were punctured by couplers, while 11 cars (or 38 percent) were punctured by rail or other objects. The shelved E coupler would not have protected the tank head from punctures caused by "rail or other objects" while the head shield would have provided protection against such punctures.

III. Rescission of the issued rule and promulgation of a proposed rule involving the shelf-type coupler would be in the public interest.

The petitioners state that the application of head shields is complicated, costly and time-consuming whereas the installation of the shelf coupler could be accomplished in a relatively short period of time. The Board was and is aware of the fact that installation of protective head shields will cause tank cars to be out-of-service. However, the Board has weighed public safety against inconvenience and believes that safety demands the installation of shields in order to prevent tank head punctures.

The petitioners indicate that the application of head shields will increase the light weight of each tank car by approximately 1,400 pounds. However, the Association of American Railroads under contract DOT-FR-00035 stated: "increase (in) the light weight of the cars in some cases will and in other cases will not, have an effect on the commodity carrying capacity of the car." The Board was and is aware that the majority of the tank cars affected by these amendments are designed to transport both liquefied petroleum gas and anhydrous ammonia. Since liquefied petroleum gas (LPG) has a lower density than anhydrous ammonia, the LPG capacity of such dual service designed tank cars would normally not be reduced due to the application of these head shields. In those cases where the product capacity of these tank cars will be reduced by the added weight of the shield, the Board had concluded that public safety considerations override this loss of lading capacity.

One petitioner expressed concern that the head shield might not remain attached to the car under actual operating conditions. The Board knows that competent engineering and use of good car construction practices can assure that the shields will remain affixed to the car during transportation. Inspection of

the head shield can be performed at each originating and interchange point (as required by 49 CFR 173.596) to assure that it is properly secured to the car.

Another petitioner stated:

The smaller diameters of tanks of cars of less than 1,500 gallons capacity and the greater curvature of tank heads may well result in such cars being far less susceptible to punctures of the type which the head shield is intended to prevent.

If the petitioner has technical data and test results to support this position, it may submit a petition for special permit under the provisions of 49 CFR 170.13.

Petitioners have requested the Board to consider the use of a newly developed E coupler with a top and bottom shelf on tank cars. The Board has awarded contract numbered DOT-OS-40106 to Washington University, St. Louis, Missouri to "perform a study of criteria and technology for the design of shelf couplers." Upon completion of this contract and publication of the report, the Board will give further consideration to this coupler arrangement.

Not included in the "Economic Evaluation of Tank Car Shield" cited in the amendments was accident damage occurring after 1970. Between January 1, 1971, and May 31, 1974, there were 17 incidents involving 19 head punctures to these tank cars reported to the Board. Estimated damage caused by these punctures exceeded \$15,000,000. On June 19, 1974, at the Norfolk and Western Railway Yard in Decatur, Illinois, a specification DOT-114A tank car tank head was punctured by a coupler on a box car. The escaping liquefied petroleum gas ignited and the resulting explosion and fires killed seven railroad employees, injured eight others and caused property damage in excess of \$20,000,000. It is the opinion of the Board that had the car been equipped with protective head shields, as specified in these amendments, the tank head would not have been punctured and the Decatur catastrophe would not have occurred. When these losses are considered, the economic "cost/benefit" of applying head shields in accordance with these amendments becomes more advantageous.

The Hazardous Materials Regulations Board has evaluated the Petitions for Reconsideration and it has determined that the information submitted does not justify reconsideration; therefore, these petitions are denied.

(18 U.S.C. 831-835; Sec. 9, Department of Transportation Act (49 U.S.C. 1657))

Issued in Washington, D.C. on September 6, 1974.

JOHN W. INGRAM,  
Federal Railroad Administrator,  
Member, Hazardous Materials Regulations Board.

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